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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

CAROLLA et al

Atty. Ref.: 45-309; Confirmation No. 7138

Appl. No. 10/803,891

TC/A.U. 1742

Filed: March 19, 2004

Examiner: Scott R. Kastler

For: LADLE

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Commissioner for Patents  
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Sir:

### DECLARATION

I, Lou Carolla, hereby declare and state that:

1. I am a co-applicant of the present application.
2. I have reviewed the present application and the outstanding official action dated October 31, 2005.
3. The present invention is directed to a liner for a ladle and a ladle containing the liner. The liner has a body of refractory material defining a hollow interior. The body has a continuous sidewall bounding the hollow interior; a lower closure floor and an open top. A barrier of refractory material faces an interior surface of part of the sidewall and is spaced inwardly therefrom in the hollow interior. The barrier extends from at or near the open top of the body towards the lower closure floor to define, with the facing part of the sidewall, a spout for discharging molten metal, in use, from the interior of the ladle. The barrier has two longitudinal edge surfaces. Two

facing inner portions of the sidewall are extended inwardly, and the longitudinal edge surfaces of the barrier are received at the inwardly extended portions respectively, thereby positioning the barrier at the inward spacing from, and facing, the interior surface of part of the sidewall.

4. The invention has a number of distinct features and benefits. First, two facing inner portions of the sidewall extend inwardly and a barrier is received at the inwardly extended inner portions of sidewall. Moreover, there is no outward extension of the spout structure from the body, which allows the liner of the invention to fit into an existing ladle without modification. This is illustrated in Figure 6 of the application where spout region 27 does not extend radially beyond the overall external circumference of the liner.

5. Because of the liner structure, the liner can be easily accommodated in a cylindrical or truncated cone-shaped ladle without modification. This satisfies a long-standing problem with such lined ladles.

6. Ceramic-refractory tiles are both expensive and they chill the metal, i.e., they are less insulating than the ladle lining material. The present invention allows the use of smaller tiles, which if manufactured in a conventional refractory, will have reduced cost and reduced chilling effect on the metal.

7. Figure 1 of the present application is an example of a prior art arrangement having large tile 10 extending across the liner. Generally, in my experience, large tiles of this type are prone to fracture, and may potentially introduce unwanted gas into the metal. In addition, they may have a chilling effect on the molten metal.

8. Figure 2 of the present application shows a curved barrier embedded within grooves in the sidewalls. Generally, in my experience, this type of barrier tends to crack due to uneven stresses in the barrier due to its curvature.

9. Figure 3 shows a barrier made from refractory or ceramic tile, but the spout is formed by curving the sidewall of the liner outwards beyond the external circumference of the liner and extending the extension downward by the whole length of the liner. As a result, in my experience, this type of ladle does not easily fit into any shape of ladle, i.e., the ladle would need to be modified to fit the liner or the liner designed/modified for each different ladle.

10. The problems associated with the prior designs as discussed above are overcome by the present invention which can readily fit into existing ladles.

I declare that all statements herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Lou Carolla  
Lou Carolla

11/31/2006  
Date